

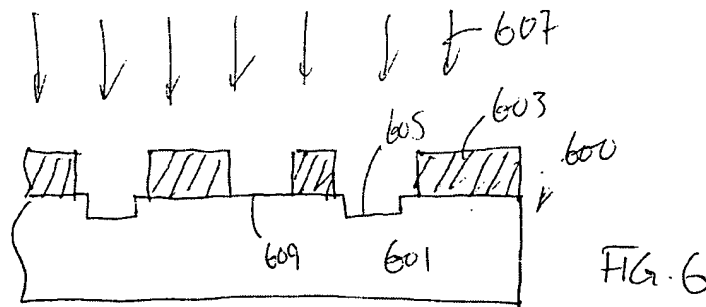
REMARKS/ARGUMENTS

Claims 1-20 are pending. Claim 20 has been amended.

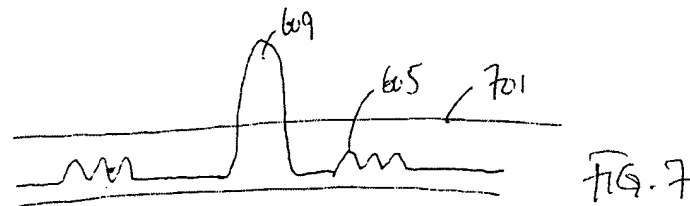
Applicant has now amended the specification to correct certain informalities noted by the Examiner. In addition, Applicant has inserted missing paragraph numbers in the specification. Paragraphs 21-43 have been re-numbered as paragraphs 23-43. Paragraph 42 has been deleted.

Claim 20 has been amended to recite "The reticle structure of claim 19..." as is recited in corresponding claim 19.

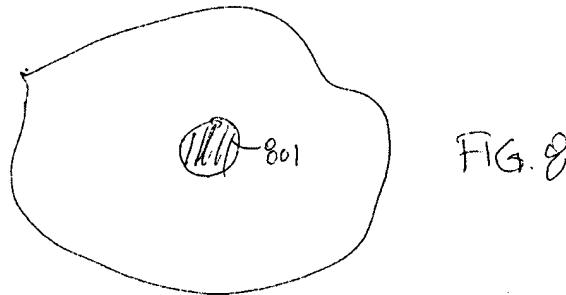
Turning now to address rejection of the pending claims based upon alleged prior art, embodiments in accordance with the present invention relate to mask structures and methods for forming mask structures, having coded spaced regions which transmit a lower intensity of light. As described in the instant specification in connection with Figs. 6-8 (reproduced below):



light 607 illuminates through one or more of the spaced regions 609 605 on a substrate 601 of mask 600, which will be used for the manufacture of integrated circuits. As also shown, the substrate also includes opaque regions 603, which form borders around each of the spaced regions. (¶[22])



Light illuminating through spaced region 609 traverses through the substrate and forms intensity pattern 609 on Figure 7. Intensity pattern 609 is above a threshold level 701 that is required to allow a selected photosensitive material to develop. Other spaced regions 605, which include structures that reduce intensity of illumination 605, is below the threshold level and do not develop during processing. (Emphasis added; ¶[22])



The developed spaced regions forms a later pattern 801 in the photosensitive material, as illustrated by Figure 8. Other regions that transmit light to the photosensitive material below the threshold level are not developed. It is believed that since a certain level of light still passes through the spaced regions with structures, interference influences between light from different spaced regions are reduced or possibly eliminated. (Emphasis added; ¶[22])

Accordingly, pending independent claims 1, 11, and 19 recite as follows:

1. A method for manufacturing a mask for integrated circuit devices, the method comprising:

... illuminating the surface region of the mask with the light source to allow the light to traverse through each of the spaced regions, whereupon the selectively coded one or more spaced regions transmits a lower light intensity to a photoresist material than a light intensity on the photoresist material from light illuminated on the photoresist material through the spaced regions free from the one or more codings (Emphasis added)

* * *

11. A method for manufacturing a coded mask structure, the method comprising:

... selectively coding at least one of the spaced regions to define a mask for a read only memory (ROM) structure, the one coded spaced region being capable of causing an interference with a light source to transmit a lower intensity of light relative to any one of the spaced regions free from the coding. (Emphasis added)

* * *

19. A reticle structure for integrated circuit device, the reticle comprising:

... at least one of the spaced regions including a code to define a masked read only memory (ROM) structure, the one coded spaced region causes an interference with a light source to transmit a lower intensity of light relative to any one of the spaced regions free from the coding. (Emphasis added)

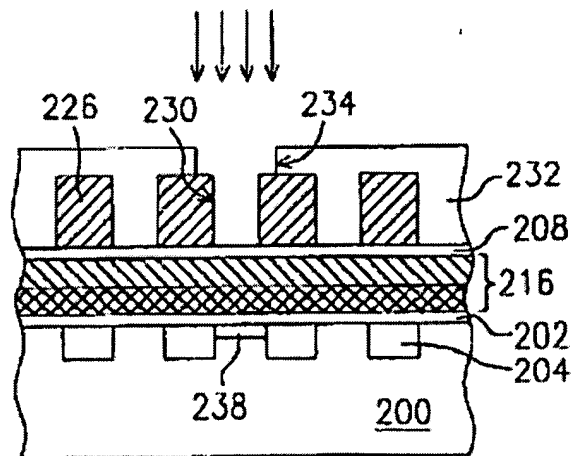
Claims 1-20 stand rejected as anticipated under 35 U.S. C. §102(e) by U.S. patent no. 6,821,684 to Yang et al. ("the Yang patent"). Claims 1-9 stand rejected as also anticipated under 35 U.S.C. §102(b) by U.S. patent no. 6,139,992 to Chen et al. ("the Chen patent"). These claim rejections are overcome as follows.

As a threshold matter, the Examiner is respectfully reminded that claims stand rejected as anticipated, and not merely obvious, in light of the Yang and Chen patents:

[t]he distinction between rejections based on 35 U.S.C. 102 and those based on 35 U.S.C. 103 should be kept in mind. Under the former, the claim is anticipated by the reference. No question of obviousness is present. In other words, for anticipation under 35 U.S.C. 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present. (Emphasis added; MPEP 706.02)

Here, the references relied upon by the Examiner fail to teach, explicitly or even impliedly, a mask transmitting a lower intensity of light.

The Yang patent does describe fabrication of a Mask ROM. However, there is no teaching, or even suggestion, in the Yang patent regarding a mask transmitting a lower intensity of light. Exemplary is the description accompanying Figure 6F (reproduced below):



coding mask layer 232 with coding windows 234 and 236 therein is formed on the substrate 200 by sequentially performing photoresist coating, exposure, development and related processes, wherein the exposing process uses a coding photo-mask. Then, a coding implantation is performed using the mask layer 232, the blocking bumps 226 and the blocking strips 222 as a mask to implant ions into the substrate 200 under the pre-coding windows 230 exposed by the coding

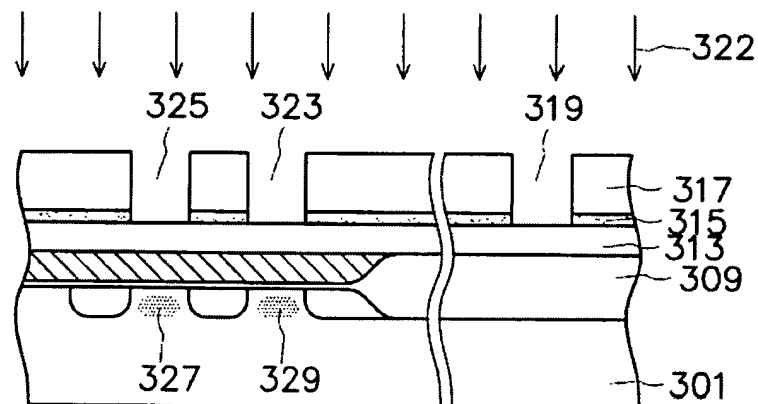
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windows 234 and 236 to form implanted coding regions 238. (Emphasis added; col. 4, lines 11-19)

This passage and figure disclose fabrication of a ROM device using a conventional photoresist mask patterned to either block or admit incident light. There is no teaching or even suggestion in the Yang patent regarding a mask transmitting reduced intensity light. In fact, the "coding photo-mask" referenced in the above passage to pattern the photoresist, is not otherwise described or even illustrated by the Yang patent, never mind characterized as allowing transmission of reduced intensity light in the manner of the claimed embodiments.

Because the Yang patent fails to teach, explicitly or even impliedly, every element of the pending claims, this reference cannot reasonably be relied upon by the Examiner to reject the pending claims as anticipated. Continued rejection of the claims based upon the Yang patent is improper, and the claim rejections should be withdrawn.

As for the Chen patent, this reference also discloses fabrication of a ROM utilizing a conventional photoresist mask. Figure 3D of the Chen patent is reproduced in part below:



photoresist layer 317 is formed on the barrier layer 315. Using the photomask shown in FIG. 3B for a photolithography process, the photoresist layer 317 is patterned to form, for example, a code area 323, a code area 325, and a bonding pad opening 319, all of which expose a portion of the barrier layer 315. (Col. 4, lines 32-38)

There is no teaching here regarding developing the photoresist, such that portions of the photoresist material corresponding to one or more coded regions transmitting light of lower

intensity, remains intact. Instead, light is either transmitted or blocked by the photomask, resulting in patterning of the photoresist.

The Chen patent does briefly mention the possibility of using a phase shift photomask to produce a shift angle of 180° of light phase at desired locations. (Col. 4, lines 7-10). This discussion is presented only in general terms, however, and nowhere does the Chen patent otherwise describe the results of using such a phase shift photomask. Such minimal disclosure by the Chen patent certainly does not rise to the level of an anticipatory teaching of the subject matter of independent claim 1 and claims 2-8 depending therefrom.

Because the Chen patent fails to teach every element of pending claims 1-9, this reference cannot reasonably be relied upon by the Examiner to reject those claims as anticipated. Continued rejection of claims 1-9 based upon the Chen patent is improper, and the claim rejections should be withdrawn.

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Kent J. Tobin', with a stylized flourish extending to the right.

Kent J. Tobin
Reg. No. 39,496

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 650-326-2400
Fax: 415-576-0300
KJT:wcf
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